

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7874-3 (1975): Methods of tests for animal feeds and feeding stuffs, Part 3: Microbiological methods [FAD 5: Livestock Feeds, Equipment and Systems]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard

METHODS OF TESTS FOR ANIMAL FEEDS AND FEEDING STUFFS

PART III MICROBIOLOGICAL METHODS

(Second Reprint NOVEMBER 1991)

UDC 636.085:543.9

© Copyright 1976

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

METHODS OF TESTS FOR ANIMAL FEEDS AND FEEDING STUFFS

PART III MICROBIOLOGICAL METHODS

Animal Feeds Sectional Committee, AFDC 15

Chairman

DR B. K. SONI

Representing

Indian Council of Agricultural Research, New Delhi

Members

AGRICULTURAL MARKETING
ADVISER TO THE GOVERNMENT
OF INDIA

Directorate of Marketing and Inspection (Ministry of Agriculture & Irrigation), Faridabad

SHRI S. JAYARAMAN (Alternate)

DR S. L. ANAOKAR

Godrej Soaps Private Limited, Bombay

DR S. P. ARORA

National Dairy Research Institute (ICAR), Karnal

DR B. N. GUPTA (Alternate)

DR C. S. BARSAUL

U. P. College of Veterinary Science & Animal Husbandry, Mathura

DR D. C. JOSHI (Alternate)

BRIG R. C. DATTA

Directorate of Military Farms, Army Headquarters

SHRI R. K. TRIPATHI (Alternate)

DIRECTOR (VANASPATI)

Directorate of Sugar and Vanaspati (Ministry of Agriculture & Irrigation), New Delhi

DEPUTY DIRECTOR (VANAS-
PATI) (Alternate)

DR N. S. DRONAWAT

The Compound Livestock Feeds Manufacturers' Association of India, Bombay

SHRI V. VIRMANI (Alternate)

SHRI R. L. GAJWANI

Voltas Limited, Bombay

SHRI K. R. FRANCIS (Alternate)

DR A. N. GHOSH

Animal Husbandry Commissioner, Ministry of Agriculture & Irrigation, New Delhi

SHRI S. S. CHIBBER (Alternate)

HEAD, ANIMAL NUTRITION
DIVISION

Indian Veterinary Research Institute (ICAR), Izatnagar

DR J. S. ICHHPONANI

Punjab Agricultural University, Ludhiana

DR L. S. HUNDAL (Alternate)

DR M. G. JACKSON

Govind Ballabh Pant University of Agriculture & Technology, Pantnagar (Distt Nainital)

SHRI N. S. MAINI

Department of Agriculture, Ministry of Agriculture & Irrigation, New Delhi

SHRI S. S. CHAUHAN (Alternate)

(Continued on page 2)

© Copyright 1976

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
DR V. M. PATIL	Dairy Development Commissioner, Government of Maharashtra, Bombay
DR B. SAHAI (<i>Alternate</i>)	
DR D. V. RANGNEKAR	Bhartiya Agro-Industries Foundation, Uruli-Kanchan (Distt Pune)
DR D. V. R. PRAKASH RAO	Shaw Wallace & Company Limited, Madras
SHRI B. LAKSHMANAN (<i>Alternate</i>)	
DR A. P. SACHDEV	All India Association of Poultry Industry, Bombay
DR G. F. MITHUJI (<i>Alternate</i>)	
DR A. SAIKIA	College of Veterinary Science, Assam Agricultural University, Gauhati
DR P. K. SHARMA (<i>Alternate</i>)	
DR S. K. SARKAR	Roller Flour Millers' Federation of India, New Delhi
SHRI S. M. MAZUMDAR (<i>Alternate</i>)	
DR (SMT) SARAJINI CHANDRA-SHEKHARAN	Kaira District Co-operative Milk Producers' Union Limited, Anand
DR A. S. DAVE (<i>Alternate</i>)	
DR N. SATPATHY	The Tata Oil Mills Company Limited, Bombay
DR K. C. DANDONA (<i>Alternate</i>)	
DR H. C. SAXENA	Hindustan Lever Limited, Bombay
DR S. YAMDAGNI (<i>Alternate</i>)	
DR K. C. SEN	In personal capacity (403 Jodhpur Park, Calcutta 31)
SHRI K. N. R. SHARMA	Directorate General of Technical Development, New Delhi
DR P. C. SHUKLA	Institute of Agriculture, Anand
SHRI G. V. SIRUR	All India Cotton Seed Crushers' Association, Bombay
SHRI R. V. BIJUR (<i>Alternate</i>)	
SHRI SURESH CHANDRA	General Molasses Co (P) Ltd, Sahibabad (Ghaziabad)
SHRI T. S. TAMBOLIA	The Maharashtra Agro-Industries Development Corporation Limited, Bombay
DR D. N. RANADE (<i>Alternate</i>)	
SHRI L. J. TANNA	Solvent Extractors' Association of India, Bombay
SHRI M. K. RAHMAN (<i>Alternate</i>)	
SHRI VINEET VIRMANI	Jawala Flour Mills, New Delhi
SHRI ANAND VIRMANI (<i>Alternate</i>)	
SHRI T. PURNANANDAM,	Director General, ISI (<i>Ex-officio Member</i>)
Deputy Director (Agri & Food)	
<i>Secretary</i>	
SHRI G. S. VILKHU	
Deputy Director (Agri and Food), ISI	

Animal Feeds and Mineral Mixtures Subcommittee, AFDC 15 : 2

Convener

DR M. L. MATHUR National Dairy Research Institute (ICAR), Karnal

Members

DR V. D. MUDGAL (*Alternate to*
DR M. L. Mathur)

AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA Directorate of Marketing and Inspection (Ministry of Agriculture & Irrigation), Faridabad

SHRI S. JAYARAMAN (*Alternate*)

(Continued on page 9)

Indian Standard

METHODS OF TESTS FOR ANIMAL FEEDS AND FEEDING STUFFS

PART III MICROBIOLOGICAL METHODS

0. FOREWORD

0.1 This Indian Standard (Part III) was adopted by the Indian Standards Institution on 28 November 1975, after the draft finalized by the Animal Feeds Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 The importance of adoption of standard and uniform methods of analysis for quality control purposes needs no emphasis. Such methods not only help in reducing divergence in the analytical results but also ensure and enable a proper comparison and correct interpretation of the test results.

0.3 During the past decade a large number of Indian Standards covering a wide range of animal feeds, feeding stuffs and feed supplements have been issued and many more are envisaged to be formulated. All these standards include methods of test that are common. It was, therefore, considered desirable to have all test methods in a consolidated form as applicable to the whole range of animal feeds, feeding stuffs and feed supplements. It was felt that such a step would not only facilitate easy reference but also prevent undue repetition. Accordingly this standard is being issued.

0.4 It is intended to issue this standard in three parts. Part I covers general methods, and Part II covers methods for determining minerals and trace elements. In this standard (Part III) detailed methods for detecting and identifying pathogenic organisms which are of significant importance in the field of animal feeds and feeding stuffs have been given.

0.5 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

*Rules for rounding off numerical values (revised).

1. SCOPE

1.1 This standard (Part III) prescribes the microbiological methods for testing animal feeds and feeding stuffs.

2. QUALITY OF REAGENTS

2.1 Unless specified otherwise, pure chemicals and distilled water (see IS: 1070-1960*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

3. SAMPLING

3.1 During collection of samples, strict precautions should be taken to avoid contamination. If feeds are packaged, an effort should be made to obtain the sealed packages. For bulk feed, samples may be collected in sterile plastic bags or sterile screw-capped jars, a sample of at least 100 g should be obtained for tests.

4. TESTING FOR *BACILLUS ANTHRACIS*

4.1 General — The method consists of isolation of the organism, microscopic examination, study of the biochemical reactions and the biological test.

4.2 Reagent

4.2.1 Sterile Sodium Chloride Solution (Normal Saline) — 0.9 percent (*m/v*).

4.3 Medium

4.3.1 Blood Agar Medium — Prepare as follows:

Add sterile defibrinated blood (5 to 10 percent by mass), collected aseptically from a healthy sheep, to nutrient agar that has been melted and cooled to 48°C. Mix well and pour into sterile plates with aseptic precautions before flame and allow to set. Incubate overnight at 37°C to check for sterility.

4.4 Isolation and Examination of the Organism — Shake about 20 g of the material with 200 ml of sterile sodium chloride solution. Decant the supernatant liquid. Centrifuge and suspend the packed sediment in about 3 ml of the sterile sodium chloride solution. Heat for 10 minutes at 70°C in a water-bath. Streak on at least three blood agar plates from this suspension and incubate at 37°C for 24 hours. Examine the characteristic colonies of *B. anthracis*. The colonies are circular and

*Specification for water, distilled quality (*revised*).

disc-like, white granular, about 3 mm in diameter, showing a ground-glass appearance and a wavy margin with only a very slight zone of haemolysis. On being examined microscopically, the colonies will consist of non-motile, gram-positive, capsulated rod-shaped organisms, 3 to 8 μm $\times$ 1 to 1.2 μm in size, straight or slightly curved with truncated ends, arranged characteristically in very long, segmented, parallel or interwoven chains. The organism ferments salicin slowly with the production of acid alone, reduces methylene blue weakly and shows a weak lecithinase reaction.

4.5 Biochemical Tests for the Differentiation of *B. anthracis* from the Anthrax-like or Pseudoanthrax Bacilli — In the absence of tests for pathogenicity, tests for: (a) motility, (b) reduction of methylene blue, (c) haemolysis, (d) fermentation of salicin, (e) rapidity of gelatin liquification, (f) action on litmus milk, and (g) the presence of lecithinase, may assist in the differentiation of *B. anthracis* and the anthrax-like or pseudoanthrax bacilli. The biochemical reactions in different tests are given in Table 1.

TABLE 1 TESTS TO DIFFERENTIATE *BACILLUS ANTHRACIS* FROM THE ANTHRAX-LIKE OR PSEUDOANTHRAX BACILLI

SL No.	TESTS	<i>B. Anthracis</i>	ANTHRAX-LIKE OR PSEUDO-ANTHRAX BACILLI
(1)	(2)	(3)	(4)
i)	Motility	Non-motile	Majority motile
ii)	Haemolysis on sheep blood Agar	None or very slight	Mostly beta type of haemolysis
iii)	Reduction of methylene blue	Not reduced or slightly reduced in 24 hours	Usually reduced in 24 hours
iv)	Fermentation of salicin	Usually negative or late	Often positive in 24 hours
v)	Gelatin liquefaction (7 days)	Negative or partial	Usually complete
vi)	Litmus milk	Not reduced or slowly	Usually reduced in 2-3 days. No peptonization
vii)	Lecithinase activity	If produced, weakly positive	Not produced (except <i>B. cereus</i>)

4.6 Biological Test — Inject subcutaneously about 1 ml of the heated suspension into two guinea pigs. If anthrax spores are present in the material, the guinea pigs will die in 12 to 48 hours showing haemorrhagic local exudate and enlargement of spleen on post-mortem. Capsulated organisms will be found in strained smears made from blood and also from the oedema fluid at the site of injection, spleen, liver and peritoneal fluid. The capsule is demonstrated easily by staining the preparation with Loeffler's alkaline methylene blue stain.

5. TESTING FOR *CLOSTRIDIUM BOTULINUM*

5.1 Medium — Either the peptic digest of beef heart or the corn steep casein glucose broth to which 0.2 percent of soluble starch has been added may be used.

5.1.1 *Peptic Digest of Beef Heart* — Prepare as follows:

Add 600 g of ground and defatted beef heart to 2 litres of distilled water. Adjust the pH to 1.8 to 2.0 with hydrochloric acid. Add 2 g of pepsin and mix thoroughly. Incubate overnight at 45 to 50°C. Filter, neutralize with sodium hydroxide and filter again. Add peptone (1 percent) and glucose (0.5 percent). Dispense and sterilize by steaming for 90 minutes in a steam sterilizer.

5.1.2 *Corn Steep Casein Glucose Broth* — Prepare as follows:

Add 3 g of casein to 50 ml of distilled water and adjust the pH between 10.5 and 11.5. Add 5 g of glucose to a volume of corn steep liquor equivalent to 5 g of total solids and dilute to 800 ml with distilled water. To this, add the casein suspension and adjust the pH to 7.3. Add distilled water to make up the volume to 1 litre. Dispense and sterilize by autoclaving.

5.2 Procedure — Inoculate about 1 g of the material into each of several conical flasks containing about 250 ml of the medium. Heat at 80°C for 30 minutes in a water-bath and incubate the different flasks at different temperatures (20°, 25°, 35° and 37°C) anaerobically for 10 days. From each flask subculture anaerobically on blood agar and egg yolk agar. *C. botulinum* produces large, irregular, greyish-white to yellowish brown colonies with a translucent irregular edge. On egg yolk agar *C. botulinum* produces both opalescence and a pearly layer. Microscopically, the colonies consist of gram-positive large bacillus (0.9 to 1.2 μm $\times$ 4 — 6 μm) occurring singly or in pairs, sometimes in short chains, and possessing oval spores, greater than the cell in diameter, situated subterminally or terminally.

5.3 Procedure for the Demonstration of *Clostridium Botulinum* Toxins — Prepare bacteria-free culture filtrate from the flasks, by passing through Milipore filters, pore size 0.45 μm . One half of the filtrate is heated for 30 minutes at 80°C in a water-bath to destroy the heat-labile toxins. Inject 2 ml of the filtrate (heated and unheated) intraperitoneally into two healthy guinea pigs for each portion. A further 2 healthy guinea pigs should be inoculated with the unheated portion of the filtrate plus the polyvalent antitoxin according to the instructions of the manufacturer. If toxin is present in the unheated filtrate, the guinea pigs will show characteristic symptoms which include hyper-secretion of saliva in a day or so, shallow-breathing, dyspnoea, muscular paralysis, dilated pupils, pendulous abdomen, prostration and death in 1 to 4 days.

In rare cases, death may be delayed to 1 to 2 weeks with a gradual loss of mass and increasing prostration. Those injected with the heated filtrate should survive. Those injected with the unheated filtrate plus polyvalent antitoxin should be protected from the effects of the *C. botulinum* toxins. No suspected organism should be identified as *C. botulinum* unless it produces the characteristic toxins in the suitable medium.

6. TESTING FOR *CLOSTRIDIUM CHAUVOEI* AND *CLOSTRIDIUM SEPTICUM*

6.1 Procedure — Mix about 100 g of the material with about 1 000 ml of the sterile sodium chloride solution. Decant the supernatant fluid and centrifuge. Suspend the packed sediment in about 3 ml of the sterile sodium chloride solution. Heat at 70°C for 20 minutes in a water-bath. Inoculate 1 ml of the heated suspension intramuscularly into each of two healthy guinea pigs alone with 0.5 ml of a freshly prepared sterile calcium chloride solution (3 percent *m/v*). Observe for 1 to 4 days within which time the animals will die of gas gangrene of the muscles at the site of injection in case the spores of *Clostridium chauvoei* or *Clostridium septicum* or both should be present. Post-mortem should be conducted immediately after the animal dies and the liver impression preparation will reveal filamentous forms if the cause of death is *Clostridium septicum*. In addition, streak the heated sample on several freshly prepared blood agar plates and incubate anaerobically at 37°C for 3 to 5 days. *Clostridium chauvoei*, if present, will develop in the form of irregularly round colonies 3 to 6 mm in diameter, effuse with entire or rhizoid edge. There will be no definite haemolytic zone but the plate will be cleared slightly around the colonies. *Clostridium septicum* colonies will be larger, about 10 mm in diameter, irregularly round, effuse and having a cigarette-in-water appearance. Haemolysis will be of the beta type with prolonged incubation.

7. TESTING FOR *CLOSTRIDIUM PERFRINGENS* (syn *C. WELCHII*)

7.1 For testing presence of *Clostridium perfringens* (syn *C. Welchii*) the method given in 8 of IS : 5887-1970* shall be employed.

8. TESTING FOR COLIFORM ORGANISMS

8.1 The coliform group of bacteria in this standard includes all aerobic, facultative aerobic, gram-negative, non-spore forming rods capable of fermenting lactose with the production of acid and gas within 48 hours at 37°C on solid or liquid media. They include a number of species of *Escherichia*, *Aerobacter*, *Klebsiella* and the *Paracolin bacilli*. The presence of these organisms gives a rough index of faecal contamination.

*Methods of detection of bacteria responsible for food poisoning and food-borne diseases.

8.2 Medium

8.2.1 Violet Red Bile Agar (VRBA) — Prepare the medium preferably from dehydrated base (or from ingredients) consisting of 0.3 percent yeast extract, 0.7 percent peptone, 0.15 percent bile salts, one percent lactose, 0.5 percent sodium chloride, 1.5 percent agar, 0.003 percent neutral red and 0.0002 percent crystal violet meant for use in bacteriological work, in water, with final of pH 7.4 ± 0.1 . After complete dehydration, cool to 42 to 44°C before pouring in plates. After solidification of the medium in plate, add cover layer of the medium. Preferably prepare the medium shortly before use, otherwise sterilize by autoclaving at 121°C for 15 minutes before use.

8.3 Quantitative Coliform Test

8.3.1 Melt sufficient violet red bile agar in boiling water, cool and hold in a water-bath at 45°C until needed. Slightly loosen screw caps on bottles before heating medium. Prepare 10^0 , 10^{-1} , 10^{-2} , 10^{-3} , 10^{-4} dilutions of the feed sample in sterile phosphate buffered distilled water (diluent). For solid specimens, mixing and dilution is facilitated by homogenizing the specimen in the diluent with the aid of a blender. Standard bacteriological transfer pipettes are used in making dilutions. Transfer one ml of well mixed dilution into corresponding previously labelled sterile petri dishes. Transferring 0.1 ml of a dilution to a dish will increase the dilution factor by 10. For each dilution 2 plates are poured. Lift cover of dish only sufficiently to admit pipette.

8.3.2 Remove cap from bottle of violet red bile agar medium (which should not be above 45°C) and after flaming neck, pour 10 to 12 ml of the melted medium into each dish. Immediately, replace lid and mix medium and inoculum by gently rotating the dish first in one direction and then in the opposite. Care shall be taken not to splash medium over edge of dish. After the medium in the inoculated dishes has hardened, add aseptically, about 3 to 4 ml more medium to completely cover the surface of the medium in the dish, tilt dish in various directions until the added medium entirely covers the surface and then allow to harden. Count the colonies developing upon the medium after 24 hours of incubation at 35 to 37°C, choosing only those plates having 30 to 300 colonies, which are dark red in colour, and have a diameter of at least 0.5 mm. Record count as coliform per ml or gram of product using the appropriate dilution factor.

9. TESTING FOR SALMONELLA

9.1 For testing *salmonella* the methods given in 6 of IS:5887-1970* shall be employed.

*Methods of detection of bacteria responsible for food poisoning and food-borne diseases.

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SHRI M. K. DATTARAJ SHRI M. K. PANDURANGA SETTY (<i>Alternate</i>)	Mysore Feeds Private Limited, Bangalore
HEAD, ANIMAL NUTRITION DIVISION DR P. V. RAO (<i>Alternate</i>)	Indian Veterinary Research Institute (ICAR), Izatnagar
DR J. S. ICHHPONANI DR M. G. JACKSON	Punjab Agricultural University, Ludhiana Govind Ballabh Pant University of Agriculture & Technology, Pantnagar (Distt Nainital) Aries Agro-Vet Industries Private Ltd, Bombay
DR T. B. MIRCHANDANI DR R. S. ADAVI (<i>Alternate</i>) DR V. M. PATIL	Dairy Development Commissioner, Government of Maharashtra, Bombay
DR B. SAHAI (<i>Alternate</i>) DR B. C. PATNAYAK	Central Sheep & Wool Research Institute (ICAR), Avikanagar (Rajasthan) Shaw Wallace & Company Limited, Madras
DR D. V. R. PRAKASH RAO SHRI B. LAKSHMANAN (<i>Alternate</i>) SHRI K. V. R. RAO DR T. R. NATARAJAN (<i>Alternate</i>)	The Boots Company (India) Ltd, Bombay
DR (SMT) SAROJINI CHANDRA- SHEKHARAN DR A. S. DAVE (<i>Alternate</i>)	Kaira District Co-operative Milk Producers' Union Limited, Anand
DR H. C. SAXENA DR S. YAMDAONI (<i>Alternate</i>) DR P. C. SHUKLA SHRI VINEET VIRMANI SHRI ANAND VIRMANI (<i>Alternate</i>)	Hindustan Lever Limited, Bombay Institute of Agriculture, Anand Nandi Provender Mills, New Delhi

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 331 01 31, 331 13 75

Telegrams: Manaksanstha
(Common to all Offices)

Regional Offices:

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	{ 331 01 31 331 13 75
*Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	36 24 99
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	{ 2 18 43 3 16 41
Southern : C. I. T. Campus, MADRAS 600113	{ 41 24 42 41 25 19 41 29 16
†Western : Manakalaya, E9 MIDC, Marol, Andheri (East), BOMBAY 400093	6 32 92 95

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMADABAD 380001	{ 2 63 48 2 63 49
‡Peenya Industrial Area 1st Stage, Bangalore Tumkur Road BANGALORE 560058	{ 38 49 55 38 49 56
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003	6 67 16
Plot No. 82/83, Lewis Road, BHUBANESHWAR 751002	5 36 27
53/5, Ward No. 29, R.G. Barua Road, 5th Byelane, GUWAHATI 781003	3 31 77
5-8-56C L. N. Gupta Marg (Nampally Station Road), HYDERABAD 500001	23 10 83
R14 Yudhister Marg, C Scheme, JAIPUR 302005	{ 6 34 71 6 98 32
117/418 B Sarvodaya Nagar, KANPUR 208005	{ 21 68 76 21 82 92
Patliputra Industrial Estate, PATNA 800013	6 23 05
T.C. No. 14/1421, University P.O., Palayam TRIVANDRUM 695035	{ 6 21 04 6 21 17

Inspection Offices (With Sale Point):

Pushpanjali, First Floor, 205-A West High Court Road, Shankar Nagar Square, NAGPUR 440010	2 51 71
Institution of Engineers (India) Building, 1332 Shivaji Nagar, PUNE 411005	5 24 35

*Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072

†Sales Office in Bombay is at Novelty Chambers, Grant Road, 89 65 28
Bombay 400007

‡Sales Office in Bangalore is at Unity Building, Narasimharaja Square, 22 36 71
Bangalore 560002

AMENDMENT NO. 1 JULY 1997
TO
IS 7874 (Part 3) : 1975 METHODS OF TESTS FOR
ANIMAL FEEDS AND FEEDING STUFFS
PART 3 MICROBIOLOGICAL METHODS

(*Page 4, clause 2.1, line 2*) — Substitute 'IS 1070 : 1992*' for 'IS : 1070 - 1960'.

(*Page 4, footnote with "*" mark*) — Substitute 'Reagent grade water (*third revision*)' for the existing footnote.

(*Page 7, clause 7.1, line 2*) — Substitute 'IS 5887 (Part 4) : 1976*' for '8 of IS : 5887 - 1970*'.

(*Page 7, footnote with "*" mark*) — Substitute 'Methods for detection of bacteria responsible for food poisoning : Part 4 Isolation and identification of *Clostridium Welchii*, *C. Botulinum* and *Bacillus Cereus* and enumeration of *C. Welchii* and *Bacillus Cereus* (*first revision*)' for the existing footnote.

(*Page 8, clause 9.1, line 1*) — Substitute 'IS 5887 (Part 3) : 1976*' for '6 of IS : 5887 - 1970'.

(*Page 8, footnote with "*" mark*) — Substitute 'Methods for detection of bacteria responsible for food poisoning : Part 3 Isolation and identification of *Salmonella* and *Shigella* (*first revision*)' for the existing footnote.

(FAD 5)